REMARKS

The present Amendment amends claims 1, 2, 6, 7, 11, 12 and 15, leaves claims 3-5, 8-10, 13 and 14 unchanged and adds new claim 16. Therefore, the present application has pending claims 1-16.

The Abstract stands objected to due to informalities noted by the Examiner in paragraph 6 of the Office Action. Particularly the Examiner objects to the Abstract as containing more than 150 words. Applicants have reviewed the Abstract as amended by the January 29, 2004 Preliminary Amendment, said Abstract being reproduced herein. It is noted that the Abstract as amended by the January 29, 2004 Preliminary Amendment contains 150 words thereby complying with the requirements of MPEP §608.01(b). Therefore, this rejection has been overcome and should be withdrawn.

Claims 1, 6 and 11 stand rejected under 35 USC §102(b) as being anticipated by Ito (U.S. Patent Publication No. 2002/016792). This rejection is traversed for the following reason. Applicants submit that the features of the present invention as now recited in claims 1, 6 and 11 are not taught or suggested by Ito whether taken individually or in combination with any of the other references of record. Therefore, Applicants respectfully request the Examiner to reconsider and withdraw this rejection.

The features of the present invention as now more clearly recited in the claims are directed to a storage system, a file reference method of a storage system and a network system including plural storage systems.

The storage system according to the present invention as recited in the claims includes a disk system having at least one disk to store data, a disk control unit to control writing and reading of data to and from said at least one disk, and a disk cache for transmitting and receiving data to and from said at least one disk; a file server, connected to said disk system, including a Central Processing Unit (CPU), a main memory to store programs and data for the CPU, and a network interface to be coupled to clients through a network; and interfaces for sending and receiving data to and from other storage systems through a communication link.

The main memory according to the present invention includes a file system-processing unit managing storage areas of said at least one disk, so that files are correlated with data locations on said at least one disk, and a file-system cache to be used by said file system-processing unit. The disk control unit receives data of a file that has been updated in another storage system and a history of file-management information from another disk system through the communication link and stores the received data of a file and the history of file-management information on the disk system. The file server refers to the history of the file-management information on the disk system and updates file-management information in the file-system cache in accordance with the update of the file performed in the other storage system.

The object of the present invention as recited in the claims is intended to solve a problem that occurs when a remote copy has been set up between a local storage system and a remote storage system and data of the local storage system is transferred to the remote storage system. In such a situation, for example, if the user data of the local storage system is

transferred to the remote storage system, then the local storage system caches file management information corresponding to the user data. Thus, the file management information is not written into the remote storage system and the contents of any updates at the local storage system are not reflected at the remote storage system.

The present invention as recited in the claims overcomes the above problem by providing a file server at, for example, the remote storage system, wherein the file server refers to a history of the file-management information on the disk system and updates the file-management information in the file-system cache in accordance with the update of the file performed in the local storage system.

The above described features of the present invention now more clearly recited in the claims are not taught or suggested by any of the references of record whether taken individually or in combination with each other. Particularly, the above described features of the present invention as now more clearly recited in the claims are not taught or suggested by Ito whether taken individually or in combination with any of the other references of record.

Ito teaches a file system which includes at least one node having a file server which processes files distributed and managed in a plurality of physical disk devices, wherein a file ID is defined for each of said files. As per Ito the node includes a file management table having records each composed of a file ID and a logical disk ID of a logical disk which stores a file corresponding to the file ID, a logical disk management table including records each composed of the logical disk ID and one or more I/O paths, wherein one or

more I/O paths are used for accessing one or more physical disk devices corresponding to the logical disk. Upon receiving a request for accessing a file specifying a file ID from a user, the file server refers to the file management table, determines a logical disk ID of a logical disk storing said file based on said file ID, refers to said logical disk management table to determine an I/O path for accessing a physical disk device corresponding to said logical disk based on said logical disk ID, and accesses the physical disk device by use of the determined I/O path.

Specifically Ito teaches, for example, in paragraph [0075] that:

> "when the contents of a file management table has been changed, and as a result, it is necessary to write back the changed contents to a physical disk device connected to the local node, the file server in the local node directly writes back the changed contents of the file management table to the physical disk device. When it is necessary to write back the changed contents to a physical disk device connected to a remote node, on the other hand, the file server in the local node transfers the changed contents of the file management table to the remote node to which the physical disk device is connected. After that, the file server in the remote node to which the physical disk device is connected writes back the changed contents. For example, when the file server 140 in the node 100 writes back contents of the file management table 160 to the physical disk device 10, the file server 140 refers to the logical disk ID field 162 in an entry to be written back in the file management table 160, and obtains the logical disk ID (in this case, "123") of a logical disk to write back to. The file server 140 then searches the logical disk management table 170 to obtain the I/O path ("200, 290, 11") used to access the physical disk device corresponding to the logical disk ID, and transmits the entry to be written back in the file management table to the file server (file server 240) in the node (node 200) corresponding to the node number "200" included in the I/O path. The file server 240 first writes the received data into the file management table 260. After that, the file server 240 collectively writes the written data and other data stored in the file management table to the physical disk device 10 as updated contents of the file management table 260. Previously, the file server 240 searches the logical disk management table 270 and

converts the logical disk ID "123" (the value of the logical disk ID field 262) to obtain an I/O path for accessing the physical disk device 10.

As is clear from the above Ito teaches file server to file server write back of data. There is no teaching or suggestion in Ito where disk system to disk system copy and update of information in the file server of the second disk system since it does not know the location of the write data in the disk system.

Thus, Ito fails to teach or suggest that the file server refers to the history of the file-management information on the disk system and updates file-management information in said file-system cache in accordance with the update of the file performed in the other storage system as recited in the claims.

Therefore, as is quite clear from the above, the features of the present invention as now more clearly recited in each of the claims are not taught or suggested by Ito whether taken individually or in combination with any of the other references of record. Accordingly, reconsideration and withdrawal of the 35 USC §102(b) rejection of claims 1, 6 and 11 as being anticipated by Ito is respectfully requested.

The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to the references utilized in the rejection of claims 1, 6 and 11.

Applicants note that the Examiner indicated in the Office Action claims 2-5, 7-10, and 12-15 contain allowable subject matter. Amendments were made to these claims to place them in condition for allowance as indicated by the Examiner.

The present Amendment adds new claim 16. New claim 16 depends from claim 1. Therefore, the same arguments presented above for claim 1 apply as well to claim 16.

In view of the foregoing amendments and remarks, applicants submit that claims 1-16 are in condition for allowance. Accordingly, early allowance of claims 1-16 is respectfully requested.

To the extent necessary, the applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C., Deposit Account No. 50-1417 (501.43385X00).

Respectfully submitted,

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